Claims

1. Method for applying extracorporeally generated acoustic pressure waves, specifically shock waves, to the body of an organism,
characterized in that the effect of the pressure waves within the treated target area is determined using cavitation bubbles generated within the tissue of the body by recording the acoustic signals of these bubbles using at least one preferably extracorporeally disposed detector.

2. Method according to Claim 1,
characterized in that the acoustic signals are employed to measure an actual value for the effect of the pressure waves in a selected target area and the parameters of the generated pressure waves are adjusted such that the effect of the pressure waves within the target area reaches a predetermined target value.

3. Method according to Claim 2,
characterized in that the parameters of the pressure waves generated are adjusted by an automatic control.

4. Method according to Claim 1,
characterized in that the effect of the pressure waves is spatially scanned in the target area of the body using the cavitation effect measured by at least one focused detector.

5. Method according to Claim 4,
characterized in that the local change in the measured cavitation effect is evaluated to determine the interface between different tissue materials.

6. Method according to Claim 4,
characterized in that the local change in the measured cavitation effect is evaluated to determine the spatial tissue anatomy.

7. Method according to Claim 1,
characterized in that the spatial change in the cavitation effect is scanned by at least one focused detector and that the spatial pressure field of the pressure waves is computed from the measured spatial distribution of the cavitation effect and the known tissue structure.

8. Device for applying extracorporeally generated acoustic pressure waves to the body of an organism including a pressure wave generator (1) and a treatment head (2),
characterized by: at least one acoustic detector (3a, 3b) brought in contact with the surface of the body to record the acoustic signals from the cavitation bubbles generated by the pressure waves and *characterized by* an electronic evaluation means (4) to which the signals from at least one detector (3a, 3b) are fed, the parameters for the pressure waves generated by the pressure wave generator (1) being adjusted in response to the signals processed in the electronic evaluation means (4).

9. Device according to Claim 8,
characterized in that at least one detector (3a, 3b) is focusable.

10. Device according to Claim 9,
characterized in that at least two detectors (3a, 3b) are connected in a coincidence circuit.

11. Device according to Claim 10,
characterized in that the focus area of the at least one focused detector (3a, 3b) is spatially adjustable for scanning a target area of the body.

12. Device according to Claim 11,
characterized in that the electronic evaluation means (4) controls a display unit (5) which displays the measured cavitation effect.

13. Device according to Claim 12,

characterized in that the electronic evaluation means (4) drives a feedback system (6).

14. Device according to Claim 13,
characterized in that the feedback system (6) includes a control unit (6a) which controls the pressure wave generator (1) such that the actual value of the cavitation effect determined by the at least one detector (3a, 3b) and the electronic evaluation means (4) is adjusted to match a predetermined target value.

15. Device according to Claim 13,
characterized in that the feedback system (6) includes an actuating signal generator (6b) which controls the spatial adjustment of the at least one detector (3a, 3b).

16. Device according to Claim 13,
characterized in that the feedback system (6) includes an image generator (6c) which feeds the data generated by the electronic evaluation means (4) to an image-processing system (7).

Abstract

Method and Device for Applying Pressure Waves to the Body of an Organism

A method and device are described for applying extracorporeally generated pressure waves, specifically acoustic shock waves, to the body of an organism. The effect of the shock waves in the impacted target area of the body is measured by extracorporeally disposed detectors which record the acoustic signals, the acoustic signals being generated within the tissue by the cavitation bubbles caused by the shock waves. The measured cavitation effect may be utilized to control and adjust the dosage of shock waves. The use of focused detectors allows for spatial scanning of the cavitation effect – with the result that the focus of the shock waves may be controlled, the tissue structure may be scanned, and the pressure field of the shock waves may be mapped.

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